State of California

Memorandum

To: John S. Sanders, Ph.D., Chief
Environmental Monitoring and
Pest Management Branch

Date: January 27, 1998

From: **Department of Pesticide Regulation** - 1020 N Street, Room 161
Sacramento, California 95814-5624

Subject: MONITORING RESULTS FROM A BEDDED TARPED APPLICATION IN ORANGE COUNTY - METHOD 9.1

Introduction - Methyl bromide is widely used as a preplant soil fumigant for control of nematodes, fungus, diseases, and weeds. The Department of Pesticide Regulation (DPR) and county agricultural commissioners have implemented permit conditions, including buffer zones, to mitigate unacceptable methyl bromide exposure. Buffer zone distances are set so that concentrations measured at this distance do not exceed 0.21 parts per million (ppm; 24-hour time-weighted average). The buffer zone distances for the methods have been determined from data received and evaluated by DPR to date. In some instances, methods which have not been previously monitored have been assigned similar buffer zones based on their similarity to application methods with monitoring data available. Additional monitoring was conducted to test and evaluate the effectiveness of the buffer zone distances for application methods where no or limited monitoring data was available.

Materials and Methods - The second field monitored was a 4.9-acre field in Fountain Valley (Orange County) treated with methyl bromide by a tarped bed application method (method 9.1) on September 9, 1997. A tarped bed application is similar to a shallow tarped broadcast fumigation, where the area to be fumigated is disced and uncovered before application. The specific equipment for this application method formed the beds and fumigated in one operation using a Colby bed shaper. The emission calibration factor assigned to this method is similar to the method nine tarped bed application. In this case, a 1.5 mil black tarpaulin was secured over beds formed immediately following injection of methyl bromide; the furrows were left untarped. The methyl bromide was injected into the soil through tractor-mounted shanks at a depth of 12 - 14 inches. The application rate was 243 pounds per acre of formulated product, 67 percent methyl bromide/33 percent chloropicrin. The application took approximately 7.5 hours.

Ambient air samples were collected at 10 locations using charcoal tubes and SKC air samplers. The ten samplers were located at the expected resident buffer zone distance, four on each long side and one on the narrow sides. The buffer zone determined for the application was 30 feet. Samplers were set up assuming that 7 acres would be fumigated. Instead, 4.9 acres were treated and the locations of the samplers relative to the field edge changed; samplers on the west side were not located at the buffer zone distance. The field east of the application was treated one and two days prior to the monitored application. Therefore, the samplers were placed only 20 feet from the field to avoid placing them in the adjacent field, Table 1 and Figure 1 indicate the position of each sampler. A series of five samples was collected at each of the 10 locations beginning with a start of fumigation at 07:30. Samples were collected for two 6-hour and one 12-hour periods, for a total of 24 hours.

The weather was clear and sunny during daylight and clear at night with temperatures from 68 to 85 degrees Fahrenheit. Wind speeds ranged from calm, to 12.7 miles per hour with speeds of five miles per hour, or less, for 70 percent of the time during monitoring. The wind blew predominantly to the east and northeast during the monitoring period.

Results - Off-site air concentrations did not exceed DPR's target level of 0.21 parts per million (24-hour time weighted average) at the resident buffer zone distance of 30 feet (Tables 1). Air concentrations ranged from 0.13 to 0.17 parts per million (24-hour time weighted average) at 20 feet from the downwind edge of the field. The highest concentrations were detected during the first 6-hour monitoring interval.

Please feel free to call if you have any questions.

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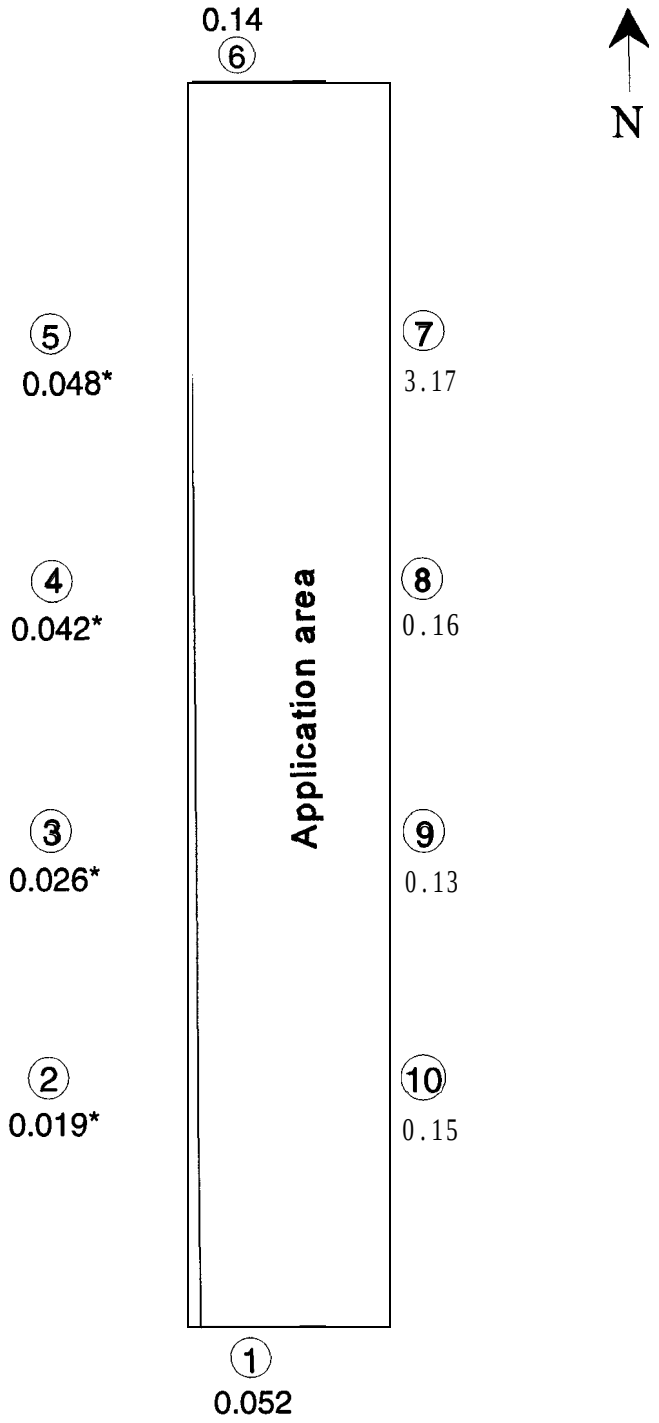
Figure 1. The application site, sampling sites and highest 24-hour time weighted averages (parts per million). (* indicates a period of no detectable amount where ½ the detection limit was used).



Sites 2-5 are located approximately 115 feet from field
Sites 1, 6-10 are located approximately 20 feet from field

Table 1. Ambient methyl bromide air concentrations.

Sampler Location			Methyl Bromide (ppm) for Each Sampling Period			
Site	Direction	Distance (ft)	7:30 - 13:30 (6 hrs)	13:30 - 19:30 (6 hrs)	19:30 - 7:30 (12 hrs)	24-hr TWA[1] (24 hrs)
1	south	20	0.064	0.020	0.062	0.052
2	west	115	ND	ND	0.037	0.019*
3	west	115	ND	ND	0.053	0.026*
4	west	115	ND	ND	0.083	0.042*
5	west	115	ND	ND	0.096	0.048*
6	north	17	0.083	0.154	0.154	0.136
7	east	20	0.335	0.190	0.083	0.173
8	east	20	0.301	0.169	0.079	0.157
9	east	20	0.224	0.166	0.062	0.128
10	east	20	0.313	0.176	0.061	0.153

[1] the time-weighted average of the 24-hour concentrations
* indicates a period of no detectable amount where ½ the detection limit was used
ND = No detectable amount; reporting limit = 0.010 ppm